Docket No.: 12810-00334-US1
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Andreas Eipper et al.

Application No.: 10/587,997 Confirmation No.: 4348

Filed: August 1, 2006 Art Unit: 1764

For: FLUID POLYESTER MOULDING MASSES Examiner: D. L. Lee

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.37(a), this brief is filed more than two months after the Notice of Appeal filed in this case on April 18, 2011, and is in furtherance of said Notice of Appeal.

The fees required under § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1205.2:

I.	Real Party In Interest
II	Related Appeals and Interferences
III.	Status of Claims
IV.	Status of Amendments
V.	Summary of Claimed Subject Matter
VI.	Grounds of Rejection to be Reviewed on Appeal
VII.	Argument
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I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

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II. RELATED APPEALS AND INTERFERENCES

Decisions in appeals in US Patent Application Nos. 11/577,009; 11/632,703; 11/659,625; 11/813,833; 11/996,274; and 11/996,489 may directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 14 claims pending in application.

B. Current Status of Claims

1. Claims canceled: 0
2. Claims withdrawn from consideration but not canceled: 0
3. Claims pending: 1-14
4. Claims allowed: 0
5. Claims rejected: 1-14

C. Claims On Appeal

The claims on appeal are claims 1-14

IV. STATUS OF AMENDMENTS

Applicant did not file an Amendment After Final Rejection. Thus, the pending claims are set forth in the Response to Office Action filed March 5, 2010.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed thermoplastic molding compositions have good flowability together with good mechanical properties. In particular, the claimed molding compositions comprise highly branched or hyperbranched polycarbonates obtainable by means of a low-cost simple industrial process are suitable as significant flow improvers in thermoplastics. Further, the highly branched or hyperbranched polycarbonates achieve acombination of advantageous properties, such as high functionality, high reactivity, low viscosity, and good solubility.

According to claim 1, the thermoplastic molding composition comprises

A) from 10 to 99.99% by weight of at least one thermoplastic polyester;

B) from 0.01 to 50% by weight of a highly branched or hyperbranched polycarbonate having an OH number of from 1 to 600 mg KOH/g of polycarbonate (to DIN 53240, Part 2), a degree of branching from 10 to 99.9%, and both structural and molecular non-uniformity;

C) from 0 to 60% by weight of other additives;

wherein the total of the percentages by weight of components A) to C) is 100%. Please see page 1, lines 5-13, of the specification.

According to claim 2, component B) has a number-average molar mass M_n of from 100 to 15 000 g/mol. Please see page 9, lines 26-27, of the specification.

According to claim 3, component B) has a glass transition temperature Tg of from -80°C to 140°C. Please see page 9, lines 30-31, of the specification.

According to claim 4, component B) has a viscosity (mPas) at 23°C (to DIN 53019) of from 50 to 200 000. Please see page 9, lines 33-34, of the specification.

According to claim 5, component B) is obtainable via a process comprising:
reacting at least one organic carbonate (A) of the general formula $RO[(CO)]_nOR$ with at least one aliphatic, aliphatic/aromatic or aromatic alcohol (B) which has at least 3 OH groups, with

elimination of alcohols ROH to give one or more condensates (K), where each R, independently of the others, is a straight-chain or branched aliphatic, aromatic/aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms, and where the radicals R may also be connected to one another to form a ring, and n is an integer between 1 and 5, or ab) reacting phosgene, diphosgene or triphosgene with abovementioned alcohol (B), with elimination of hydrogen chloride, and intermolecular reaction of the condensates (K) to give a highly functional, highly branched, or highly functional, hyperbranched polycarbonate, where the quantitative proportion of the OH groups to the carbonates in the reaction mixture is selected in such a way that the condensates (K) have an average of either one carbonate group and more than one OH group or one OH group and more than one carbonate group. Please see page 9, line 36 to page 10, line 16, of the specification.

According to claim 6, the reaction mixture further comprises at least one alcohol (B') having two OH groups, with the proviso that the average total OH functionality of all of the alcohols used is greater than 2. Please see page 11, lines 28-30, of the specification.

According to claim 7, the resultant highly functional, highly branched, or highly functional, hyperbranched polycarbonate is reacted, in an additional step (step c)), with a suitable functionalizing reagent which can react with the OH and/or carbonate groups of the polycarbonate. Please see page 18, lines 13-17, of the specification.

According to claim 8, the highly functional, highly branched, or highly functional, hyperbranched polycarbonate is modified by carrying out step b) in the presence of additional compounds which have not only OH groups or carbonate groups but also other functional groups or functional elements. Please see page 17, lines 23-26, of the specification.

According to claim 9, fibers, films, or moldings are produced utilizing the thermoplastic molding composition according to claim 1. Please see page 28, lines 5-9, of the specification.

According to claim 10, a fiber, a film, or a molding is obtainable from the thermoplastic molding compositions according to claim 1. Please see page 28, lines 5-9, of the specification.

According to claim 11, B2) has an OH number of from 10 to 550 mg KOH/g. Please see page 8, line 38, of the specification.

According to claim 12, B2) has an OH number of from 50 to 550 mg KOH/g. Please see page 8, line 38, of the specification.

According to claim 13, the degree of branching is from 20 to 99%. Please see page 9, line 11, of the specification.

According to claim 14, the degree of branching is from 20 to 95%. Please see page 9, line 12, of the specification.

Support for the claimed subject matter is provided parenthetically with reference to the specification to guide the Board in its understanding of the claimed subject matter. However, support for the claims is provided throughout the specification, and is not limited to that provided in this concise summary.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Has the Examiner established that claims 1-14 are obvious over U.S. Patent No. 5,712,336 to Gareiss et al. in view of GB 2,324,797 to Davis et al., and that claims 1-14 are, therefore, unpatentable under 35 U.S.C. § 103(a)?

B. Has the Examiner established that claims 1-14 are unpatentable over claims 1-20 of copending Application No. 11/996,489 on the grounds of nonstatutory obviousness-type double patenting?

C. Has the Examiner established that claims 1-14 are unpatentable over claims 1-20 of copending Application No. 11/815,238 on the grounds of nonstatutory obviousness-type double patenting?

VII. ARGUMENT

A. Davis fails to suggest that the hyperbranched polymers may be used to control the processability of thermoplastic polyesters.

Claims 1-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,712,336 to Gareiss et al. in view of GB 2,324,797 to Davis et al.

Claim 1 recites, among other features, from 0.01 to 50% by weight of a highly branched or hyperbranched polycarbonate. As appreciated by the Examiner, Gareiss fails to suggest corresponding features. However, the Examiner asserts that a skilled art would have been motivated to combine a hyperbranched polymer containing carbonate linkages, as suggested in Davis, with the flame resistant molding compositions of Gareiss.

Prior to addressing the rejection in the Office Action, Applicants provide a brief overview over the remarkable properties of the claimed thermoplastic molding compositions. As noted at the bottom of page 27, the claimed thermoplastic molding compositions combine good flowability with good mechanical properties. By way of non-limiting example, Table 3 at page 32 demonstrates the dramatic improvement of flowability even by adding small amounts of highly branched or hyperbranched polycarbonate. Specifically, the addition of 1 percent of component B/2 in example 3 nearly doubles the melt volume rate (MVR) from 26.4 to 47.6 compared to example 1C. Similarly, the MVR of example 5 increases from 108 to 191 between example 2C and example 5.

A skilled artisan would not have had a reasonable expectation of success that adding a hyperbranched polymer according to Davis to the thermoplastic molding compositions of Gareiss would result in such dramatic increase of the MVR. At best, based on the rules of

mixture, the skilled artisan would have expected a moderate reduction in viscosity of the thermoplastic molding compositions within a linear range.

As set forth in MPEP 716.02 (a) II, the superiority of a property shared with the related art is evidence of nonobviousness. In particular, "[e]vidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art, can rebut prima facie obviousness. 'Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a prima facie case of obviousness.' No set number of examples of superiority is required." *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987).

Moreover, the Examiner failed to provide a proper rationale or motivation as to why a skilled artisan would have combined Gareiss and Davis to arrive at the claimed subject matter. For example, the statement at page 16, last paragraph, of Davis that reactive plasticizers are used in thermoplastic compositions, does not clearly identify the hyperbranched polycarbonates of Davis, but is generally directed at "[m]any of the hyperbranched polymers of the invention." The skilled artisan is not explicitly directed at polycarbonates, but is left to wonder whether Davis might be referring to hyperbranched polymers containing linkages selected from urea, urethane, ester or amine groups, which are likewise suggested in Davis.

What is more, Davis only refers to thermoplastic compositions, to which these unidentified hyperbranched polymers are added, but fails to explicitly suggest thermoplastic polyesters, as claimed. A skilled artisan, however, would assume that plasticizers are additives for PVC materials or maybe cellulosics, as evidenced by the excerpt from the Additives for Plastics Handbook, pages 203-205, Elsevier © 1996, attached to the December 28, 2010 Response to Office Action.

By contrast, additives for thermoplastic polyesters are generally process modifiers and processing aids. See the Additives for Plastics Handbook excerpt, pages 209-211. Thus, a skilled artisan would assume that Davis suggests that hyperbranched polymers are added as reactive plasiticisers to PVC materials, but not to thermoplastic polyesters.

Claim 5 does not stand and fall with the other claims.

Claim 5 recites, among other features, an intermolecular reaction of the condensates (K) to give a highly functional, highly branched, or highly functional, hyperbranched polycarbonate, where the quantitative proportion of the OH groups to the carbonates in the reaction mixture is selected in such a way that the condensates (K) have an average of either one carbonate group and more than one OH group or one OH group and more than one carbonate group.

As appreciated by the Examiner, the Davis fails to suggest a method for preparing polycarbonates, as claimed. However, the Examiner asserts, at page 4, lines 4-8, of the September 28, 2010 Office Action, that the product claimed is the same as the product suggested in Davis. Applicants respectfully disagree with this assertion.

According to the process of Davis, hyperbranched polycarbonates are produced by reacting hydroxycarboxylic acids or triols with carbonyldiimidazole as a phosgene-analog reactive component.

Davis further suggests that the thus produced imidazolides are reacted afterwards via intermolecular reaction to polycarbonates containing imidazolides as end groups. A highly or hyperbranched produced in accordance with claim 5, however, does not contain such imidazolides as end groups and is, for at least this reason, structurally distinct from the hyprbranched polymers of Davis.

Moreover, it is a distinct disadvantage of the reaction in Davis that the terminal groups are always of the imidazolid-type, which are instable and hydrolize in the presence of water or that releases imidazole by heating the hyperbranched polymers. See example 8, last line, of Davis.

In addition, after the first process step of Davis, the liberated imidazole has to be removed from the reaction mixture, which causes additionally expenditures.

What is more, the processability of the hyperbranched polymers of Davis produced under those conditions is inferior and may cause instability in the molding composition preparation due to to massive fogging and presence of undesired compounds in the mold, which manifest themselves as mold deposits.

Last but not least, Davis suggests, at example 5, that the hyperbranched polymers having carbonate linkages are rubberlike, which are not suitable for the preparation of the instantly claimed thermoplastic molding compositions.

Claims 2-14 are in condition for allowance for at least their respective dependence on an allowable claim 1, as well as for the additionally patentable subject matter that each of these claims recites.

B. Applicants respectfully request withdrawal of the provisional double-patenting rejection over the later-filed copending application 11/996,489.

Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 11/996,489. Further, the Office Action asserts that claims 1-14 are not patentably distinct from claims 1-20 of copending application 11/996,489.

Applicants respectfully request that the provisional double-patenting rejection be withdrawn in this earlier filed application and converted into a double-patenting rejection in copending application 11/996,489.

C. Applicants respectfully request withdrawal of the provisional double-patenting rejection over the later-filed copending application 11/815,238.

Claims 1-14 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of copending Application No. 11/815,238. Further, the Office Action asserts that claims 1-14 are not patentably distinct from claims 1-20 of copending application 11/815,238.

Applicants respectfully request that the provisional double-patenting rejection be withdrawn in this earlier filed application and converted into a double-patenting rejection in copending application 11/815,238.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A. As indicated above, the claims in Appendix A include the amendments filed by Applicant on March 5, 2010.

Applicants concurrently herewith submit the requisite fee for an Appeal Brief transmittal. Applicants believes no additional fee is due with this response. However, if any such additional fee is due, please charge our Deposit Account No. 22-0185, under Order No. 12810-00334-US1 from which the undersigned is authorized to draw.

Dated: June 20, 2011

Respectfully submitted,

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APPENDIX A - CLAIMS

Claims Involved in the Appeal of Application Serial No. 10/587,997

1. A thermoplastic molding composition comprising:

A) from 10 to 99.99% by weight of at least one thermoplastic polyester;

B) from 0.01 to 50% by weight of a highly branched or hyperbranched polycarbonate having an OH number of from 1 to 600 mg KOH/g of polycarbonate (to DIN 53240, Part 2), a degree of branching from 10 to 99.9%, and both structural and molecular non-uniformity;

C) from 0 to 60% by weight of other additives;

wherein the total of the percentages by weight of components A) to C) is 100%.

2. The thermoplastic molding composition according to claim 1, wherein component B) has a number-average molar mass M_n of from 100 to 15 000 g/mol.

3. The thermoplastic molding composition according to claim 1, wherein component B) has a glass transition temperature Tg of from -80°C to 140°C.

4. The thermoplastic molding composition according to claim 1, wherein component B) has a viscosity (mPas) at 23°C (to DIN 53019) of from 50 to 200 000.

5. The thermoplastic molding composition according to claim 1, wherein component B) is obtainable via a process comprising:

reacting at least one organic carbonate (A) of the general formula $RO[(CO)]_nOR$ with at least one aliphatic, aliphatic/aromatic or aromatic alcohol (B) which has at least 3 OH groups, with elimination of alcohols ROH to give one or more condensates (K), where each R, independently of the others, is a straight-chain or branched aliphatic, aromatic/aliphatic or aromatic hydrocarbon radical having from 1 to 20 carbon atoms, and where the radicals R may also be connected to one another to form a ring, and n is an integer between 1 and 5, or

ab) reacting phosgene, diphosgene or triphosgene with abovementioned alcohol (B), with elimination of hydrogen chloride,
and

intermolecular reaction of the condensates (K) to give a highly functional, highly branched, or highly functional, hyperbranched polycarbonate,
where the quantitative proportion of the OH groups to the carbonates in the reaction mixture is selected in such a way that the condensates (K) have an average of either one carbonate group and more than one OH group or one OH group and more than one carbonate group.

6. The thermoplastic molding composition according to claim 5, wherein the reaction mixture further comprises at least one alcohol (B') having two OH groups, with the proviso that the average total OH functionality of all of the alcohols used is greater than 2.

7. The thermoplastic molding composition according to claim 5, where the resultant highly functional, highly branched, or highly functional, hyperbranched polycarbonate is reacted, in an additional step (step c)), with a suitable functionalizing reagent which can react with the OH and/or carbonate groups of the polycarbonate.

8. The thermoplastic molding composition according to claim 5, where the highly functional, highly branched, or highly functional, hyperbranched polycarbonate is modified by carrying out step b) in the presence of additional compounds which have not only OH groups or carbonate groups but also other functional groups or functional elements.

9. A method of producing fibers, films, or moldings comprising utilizing the thermoplastic molding composition according to claim 1.

10. A fiber, a film, or a molding obtainable from the thermoplastic molding compositions according to claim 1.

11. The thermoplastic molding composition according to claim 1, wherein B2) has an OH number of from 10 to 550 mg KOH/g.

12. The thermoplastic molding composition according to claim 1, wherein B2) has an OH number of from 50 to 550 mg KOH/g.

13. The thermoplastic molding composition according to claim 1, wherein the degree of branching is from 20 to 99%.

14. The thermoplastic molding composition according to claim 1, wherein the degree of branching is from 20 to 95%.

APPENDIX B - EVIDENCE

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

APPENDIX C – RELATED PROCEEDINGS

No decisions have yet been rendered by the Board in the related proceedings referenced in II. above, hence copies of decisions in related proceedings are not provided.